STIC Search Report
EIC 2600

STIC Database Tracking Number: 108302

TO:	From:
Leland Jorgensen Location: CPK2-6V3 Art Unit : 2675 Wednesday, November 19, 2003 Case Serial Number: 09/874,128	Vamshi Kalakuntla Location: EIC 2600 PK2-3C03 Phone: 306-0254 Vamshi.kalakuntla@uspto.gov

Search Notes

Dear Leland Jorgensen;

Attached please find the results of your search request 09/874,128.
I used the search strategy based on the search request and our conversation. I emailed to you to edit, not hearing from you I proceeded.
I searched the standard Dialog files, IBM TDBs, DTIC STINET, IEEE, and the internet.

If you would like a re-focus please let me know.
Please feel free to contact me if you have questions or concerns. Thank you and have a great day.

Please take a moment and fill out the attached feedback form. Thank you.

Vamshi

```
File   2:INSPEC 1969-2003/Nov W2
         (c) 2003 Institution of Electrical Engineers
File   6:NTIS 1964-2003/Nov W3
         (c) 2003 NTIS, Intl Cpyrght All Rights Res
File   8:Ei Compendex(R) 1970-2003/Nov W2
         (c) 2003 Elsevier Eng.  Info. Inc.
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Nov W2
         (c) 2003 Inst for Sci Info
File  35:Dissertation Abs Online 1861-2003/Oct
         (c) 2003 ProQuest Info&Learning
File  62:SPIN(R) 1975-2003/Oct W1
         (c) 2003 American Institute of Physics
File  65:Inside Conferences 1993-2003/Nov W3
         (c) 2003 BLDSC all rts. reserv.
File  94:JICST-EPlus 1985-2003/Nov W3
         (c)2003 Japan Science and Tech Corp(JST)
File  95:TEME-Technology & Management 1989-2003/Nov W1
         (c) 2003 FIZ TECHNIK
File  99:Wilson Appl. Sci & Tech Abs 1983-2003/Oct
         (c) 2003 The HW Wilson Co.
File 144:Pascal 1973-2003/Nov W2
         (c) 2003 INIST/CNRS
File 233:Internet & Personal Comp. Abs. 1981-2003/Jul
         (c) 2003, EBSCO Pub.
File 239:Mathsci 1940-2003/Dec
         (c) 2003 American Mathematical Society
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
         (c) 1998 Inst for Sci Info
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
         (c) 2002 The Gale Group
File 603:Newspaper Abstracts 1984-1988
         (c)2001 ProQuest Info&Learning
File 483:Newspaper Abs Daily 1986-2003/Nov 17
         (c) 2003 ProQuest Info&Learning
File 248:PIRA 1975-2003/Nov W2
         (c) 2003 Pira International
File 103:Energy SciTec 1974-2003/Nov B1
         (c) 2003 Contains copyrighted material
? ds

Set     Items   Description
S1      14208   OLED OR ORGANIC(W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR DIOD-
             E? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2     661681   WHITE
S3   15480750   BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE
              OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING)(3N-
             )(POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?)
S4    1975056   (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RGB)
S5        236   S1 AND S2 AND S3 AND S4
S6          5   S1 AND S2(5W)S3(5W)S4
S7          2   RD S6 (unique items)
S8          2   S7 NOT PY>2001
S9         33   S1 AND S2(5N)S3(5N)S4 NOT S6
S10        22   RD S9 (unique items)
S11         9   S10 NOT PY>2001
S12        10   AU=(SIWINSKI, M? OR SIWINSKI M?)
S13         9   RD S12 (unique items)
S14         3   S13 AND S1
S15         3   S14 NOT (S8 OR S11)
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8/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

7148223 INSPEC Abstract Number: B2002-02-4260D-033
Title: White **and** blue **temperature stabile and** efficient **OLEDs using amorphous spiro transport and spiro emitting compounds**
Author(s): Spreitzer, H.; Vestweber, H.; Stossel, P.; Becker, H.
Author Affiliation: Covion Org. Semicond. GmbH, Frankfurt, Germany
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4105 p.125-33
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 2001 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(2001)4105L.125:WBTS;1-E
Material Identity Number: C574-2001-114
U.S. Copyright Clearance Center Code: 0277-786X/01/$15.00
Conference Title: Organic Light-Emitting Materials and Devices IV
Conference Sponsor: SPIE
Conference Date: 31 July-2 Aug. 2000 Conference Location: San Diego, CA, USA
Language: English
Subfile: B

Title: White **and** blue **temperature stabile and** efficient **OLEDs using amorphous spiro transport and spiro emitting compounds**
...Abstract: characteristics of various devices stored at elevated temperature (up to 130 degrees C). Blue multilayer **organic light emitting diodes** (OLEDs) containing PEDT (polyethylenedioxythiophene) or PANI (polyaniline) derivatives as the hole injection and buffer layer...

... an emitting material (EM) resulted in dramatically improved temperature stability: for the white and blue **OLED** no significant deterioration up to 130 degrees C were found. Devices consisting of non spiro...

8/3,K/2 (Item 1 from file: 95)
DIALOG(R)File 95:TEME-Technology & Management
(c) 2003 FIZ TECHNIK. All rts. reserv.

01653277 20020604871
High efficiency white organic electroluminescent **devices**
(Weisse organische Elektrolumineszenzanzeigen mit hoher Ausbeute)
Kishigami, Y; Tsubaki, K; Kondo, Y; Kido, J
Yamagata Univ., J; Matsushita Electric Works, Osaka, J
Asia Display / IDW '01, Proc. of the 21st Internat. Display Res. Conf. in Conjunction with the 8th Internat. Display Workshops, Vol. 1, Nagoya, J, Oct 16-19, 20012001
Document type: Conference paper Language: English
Record type: Abstract

High efficiency white organic electroluminescent **devices**

ABSTRACT:
In this paper, the authors present high efficiency white **organic electroluminescent** devices (OELDS) having a metal-doped electron injection layer at the interface between the cathode...

...To their knowledge, these luminous and quantum efficiencies are the highest values reported for white **organic** **EL** devices.
DESCRIPTORS: ELECTROLUMINESCENT DISPLAYS; **WHITE** **COLOUR** ; LIGHT **EFFICIENCY** ; LUMINANCE; QUANTUM **EFFICIENCY** ; ORGANIC SEMICONDUCTORS; DOPING AGENTS

11/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

7264527 INSPEC Abstract Number: B2002-06-7260D-012
Title: Temperature stability and efficiency **of** white **and** blue **OLEDs using amorphous spiro compounds**
Author(s): Vestweber, H.; Becker, H.; Busing, A.; Gelsen, O.; Heun, S.; Kluge, E.; Kreuder, W.; Schenk, H.; Spreitzer, H.; Stossel, P.; Treacher, K.
Author Affiliation: Covion Org. Semicond. GmbH, Frankfurt, Germany
Journal: ITG-Fachbericht Conference Title: ITG-Fachber. (Germany) no.165 p.31-6
Publisher: VDE-Verlag,
Publication Date: 2001 Country of Publication: Germany
CODEN: ITGFEY ISSN: 0932-6022
SICI: 0932-6022(2001)165L.31:TSEW;1-3
Material Identity Number: G434-2001-007
Conference Title: 9th Triennial Conference of the ITG-Chapter 8.6 "Vacuum Electronics and Displays"
Conference Date: 2-3 May 2001 Conference Location: Garmisch-Partenkirchen, Germany
Language: English
Subfile: B

Title: Temperature stability and efficiency **of** white **and** blue **OLEDs using amorphous spiro compounds**
...Abstract: characteristics of various devices stored at elevated temperature (up to 130 degrees C). Blue multilayer **organic light emitting diodes** (OLEDs) containing PANI (polyaniline) derivatives as the hole injection and puffer layer, aromatic diamines like...

... an emitting material (EM) resulted in dramatically improved temperature stability: for the white and blue **OLED** no significant deterioration up to 130 degrees C were found. Devices consisting of non spiro...
Identifiers: blue **OLED** ; ...

...white **OLED** ; ...

...multilayer **OLED** ;

11/3,K/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

7156079 INSPEC Abstract Number: B2002-02-4260D-059
Title: Structure and characterization of a white up-emitting OLED **on silicon for microdisplays**
Author(s): Feng, T.; Ali, T.A.; Ramakrishnan, E.S.; Campos, R.; Howard, W.E.
Author Affiliation: eMagin Corp., Hopewell Junction, NY, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4105 p.30-6
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 2001 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(2001)4105L.30:SCWE;1-Z
Material Identity Number: C574-2001-114

U.S. Copyright Clearance Center Code: 0277-786X/01/$15.00
Conference Title: Organic Light-Emitting Materials and Devices IV
Conference Sponsor: SPIE
Conference Date: 31 July-2 Aug. 2000 Conference Location: San Diego, CA, USA
Language: English
Subfile: B

Title: Structure and characterization of a white up-emitting OLED **on silicon for microdisplays**
Abstract: We have developed highly **efficient** , top-emitting **white** **OLED** structures suitable for black-and- **white** or full **color** microdisplay applications. White light emission was obtained from both singly doped and doubly doped emitter...

... that of the single dopant structure incorporating only the red dopant. For top-emitting, white **OLED** devices with the double-dopant structure, we have achieved luminous efficiencies of 974 cd/m...

... sup 2/ for more than 3000 hrs. Based on an up-emitting, double-dopant white **OLED** structure, we have developed an SXGA-resolution, black-and-white active matrix **OLED** (AMOLED) on silicon microdisplay. This AMOLED-on-Si has demonstrated real-time video with 256...
Identifiers: white up-emitting **OLED** ; ...

...top-emitting white **OLED** ; ...

...up-emitting double-dopant white **OLED** structure...

...black-and-white active matrix **OLED** ;

Waiting on

11/3,K/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

6204244 INSPEC Abstract Number: A1999-09-7860F-006, B1999-05-4220-002
Title: Efficient full color electroluminescence and stimulated emission with polyphenylenes
Author(s): Leising, G.; List, E.J.W.; Zenz, C.; Tasch, S.; Brandstaetter, C.; Graupner, W.; Markart, P.; Meghdadi, F.; Kranzelbinder, G.; Niko, A.; Resel, R.; Zojer, E.; Schlichting, P.; Rohr, U.; Geerts, Y.; Scherf, U.; Mullen, K.; Smith, R.; Gin, D.
Author Affiliation: Inst. fur Festkorperphys., Tech. Univ. Graz, Austria
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3476 p.76-87
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1998 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1998)3476L.76:EFCE;1-H
Material Identity Number: C574-1999-050
U.S. Copyright Clearance Center Code: 0277-786X/98/$10.00
Conference Title: Organic Light-Emitting Materials and Devices II
Conference Sponsor: SPIE
Conference Date: 21-23 July 1998 Conference Location: San Diego, CA, USA
Language: English
Subfile: A B

Abstract: We demonstrate the fabrication and characterization of highly **efficient red - green - blue (RGB)** and **white** light emitting devices based on poly(phenylene) type materials as the hexaphenyl and the methyl...

...composite is confirmed by X-ray diffraction analysis. The application of the nano-composites in **organic - light - emitting - diodes** is presented. A suitably structured m-LPPP waveguide shows a spectrally very narrow high directional...

...Identifiers: **organic light emitting diodes** ;

11/3,K/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

5911519 INSPEC Abstract Number: B9806-7260-047
Title: Performance of RGB multi-color organic EL **display**
Author(s): Matsuura, M.; Tokailin, H.; Eida, M.; Hosokawa, C.; Hironaka, Y.; Kusumoto, T.
Author Affiliation: Central Res. Labs., Idemitsu Kosan Co. Ltd., Chiba, Japan
Conference Title: Proceedings of Fifteenth International Display Research Conference. Asia Display '95 p.269-72
Publisher: Inst. Telev. Eng. Japan & SID, Tokyo, Japan & Santa Ana, CA, USA
Publication Date: 1995 Country of Publication: USA xxvi+981 pp.
Material Identity Number: XX95-01936
Conference Title: Proceedings of 15th International Display Research Conference
Conference Sponsor: Inst. Telev. Eng. Japan; SID
Conference Date: 16-18 Oct. 1995 Conference Location: Hamamatsu, Japan
Language: English
Subfile: B

Title: Performance of RGB multi-color organic EL **display**
Abstract: The authors present a RGB multi-color display of **organic EL** , which was realized as a new multi-color system in which a blue **organic EL** display was combined with color changing media (CCM). CCM are made up of organic fluorescent...

...the use of CCM, it was possible to obtain RGB colors based on a blue **organic EL** display. In this system, there are significant advantages over the previous multi- **color** systems; the efficiencies of **RGB** emission in this system are **higher** than that of the **white** display with **color** filters. The fabrication process of the system is simple as compared with the process of...
Identifiers: RGB multi-color **organic EL** display...

... **organic EL** ; ...

...blue **organic EL** display

11/3,K/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

5876836 INSPEC Abstract Number: B9805-7260-012
Title: The application of poly(phenylene) type polymers and oligomers in electroluminescent color displays
Author(s): Tasch, S.; Brandstatter, C.; Graupner, W.; Hampel, S.; Hochfilzer, C.; List, J.W.E.; Meghdadi, F.; Leising, G.; Schlichting, P.; Rohr, U.; Geerts, Y.; Scherf, U.; Mullen, K.
Author Affiliation: Inst. fur Festkorperphys., Tech. Univ. Graz, Austria
Conference Title: Flat Panel Display Materials III. Symposium p.325-30
Editor(s): Fulks, R.T.; Parsons, G.N.; Slobodin, D.E.; Yuzuriha, T.H.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1997 Country of Publication: USA xi+338 pp.
ISBN: 1 55899 375 4 Material Identity Number: XX97-02853
Conference Title: Flat Panel Display Materials III. Symposium
Conference Date: 31 March-3 April 1997 Conference Location: San Francisco, CA, USA
Language: English
Subfile: B

...Abstract: the oligomer hexaphenyl, are very suitable materials for realisation of efficient, stable, large area blue **organic light emitting diodes** (OLEDs). The emission of blue OLEDs can be efficiently converted into all other emission colours...

... EL device is covered with highly fluorescent dye/matrix layers, which are excited by the **blue** emission and emit **lower** energy photoluminescent light. Secondly, a new method for producing **efficient white** light emitting polymer diodes (e.g. for backlight sources in liquid crystal displays) based on...
...Identifiers: **organic light emitting diodes** ; ...

... **OLED** efficiency...

... **OLED** stability...

...blue **OLED** emission conversion

11/3,K/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

5696373 INSPEC Abstract Number: B9710-4260D-037
Title: White and unsaturated color organic light emitting diodes
Author(s): Dodabalapur, A.; Strukelj, M.; Jordan, R.H.; Rothberg, L.J.; Miller, T.M.
Author Affiliation: AT&T Bell Labs., Murray Hill, NJ, USA
Conference Title: Electrical, Optical, and Magnetic Properties of Organic Solid State Materials III. Symposium p.59-63
Editor(s): Jen, A.K.-Y.; Lee, C.Y.-C.; Dalton, L.R.; Rubner, M.F.; Wnek, G.E.; Chiang, L.Y.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1996 Country of Publication: USA xvi+710 pp.
Material Identity Number: XX96-02015
Conference Title: Electrical, Optical, and Magnetics Properties of Organic Solid State Materials III. Symposium
Conference Date: 27 Nov.-1 Dec. 1995 Conference Location: Boston, MA, USA
Language: English
Subfile: B

Title: White and unsaturated color organic light emitting diodes
Abstract: We describe the principles of operation and device characteristics of novel **organic light emitting diodes** in which the emission originates in a number of optically active layers. The effective emission...

...can be controlled by adjusting the thicknesses of the individual layers, and in this manner **white** and other unsaturated **color** LEDs with external quantum **efficiency** >0.5% have been fabricated. The maximum luminance that has been achieved is ~4,700...
Identifiers: **organic light emitting diodes** ;

11/3,K/7 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06797079 Genuine Article#: ZT437 No. References: 28
Title: The effect of the thicknesses of the various layers on the colour emitted by an organic electroluminescent **device**
Author(s): Jolinat P (REPRINT) ; Clergereaux R; Farenc J; Destruel P
Corporate Source: CNRS,ESA 5003, LAB GENIE ELECT TOULOUSE, 118 ROUTE NARBONNE/F-31062 TOULOUSE//FRANCE/ (REPRINT)
Journal: JOURNAL OF PHYSICS D-APPLIED PHYSICS, 1998, V31, N10 (MAY 21), P 1257-1262
ISSN: 0022-3727 Publication date: 19980521
Publisher: IOP PUBLISHING LTD, DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE, ENGLAND
Language: English Document Type: ARTICLE (ABSTRACT AVAILABLE)

Title: The effect of the thicknesses of the various layers on the colour emitted by an organic electroluminescent **device**
Abstract: **Organic electroluminescent** diodes based on thin organic layers are one of the most promising next-generation systems...
...Identifiers-- **WHITE** -LIGHT; **BLUE** ELECTROLUMINESCENCE; THIN-FILMS; DIODES; POLYMER; POLYANILINE; **EFFICIENCY**; COMPLEXES; EMISSION

11/3,K/8 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

04152944 JICST ACCESSION NUMBER: 99A0670211 FILE SEGMENT: JICST-E
Organic EL **Device with Quantum-Confined Structure.**
OMORI YUTAKA (1); YOSHINO KATSUMI (1)
(1) Osaka Univ., Grad. Sch.
Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Enginners), 1999, VOL.99,NO.137(OME99 23-33), PAGE.45-50, FIG.7, REF.5
JOURNAL NUMBER: S0532BBG
UNIVERSAL DECIMAL CLASSIFICATION: 621.383:535.35
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication

Organic EL **Device with Quantum-Confined Structure.**
ABSTRACT: Recently, **organic electroluminescentdiode** (EL) diodes have

been extensively studied for high intencity, high **efficiency** , **white** light emission, and multi- **color** emission, and so on. **Organic EL** diodes heve been developed to exhibit novel device characteristics utilizing quantum confined superlattice structure of dye molecules. In this report, enhanced emission from **organic EL** diodes with quantum confined superlattice structure has been discussed. (author abst.)

11/3,K/9 (Item 2 from file: 94)
DIALOG(R)File 94:JICST-EPlus

03601350 JICST ACCESSION NUMBER: 98A0679919 FILE SEGMENT: JICST-E
R-G-B Emitting Multi-Color Organic EL **Device.**
OMORI YUTAKA (1); TADA NORIO (1); KUROSAKA TAKENORI (1); YOSHINO KATSUMI (1)
(1) Osaka Univ., Grad. Sch.
Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report (Institute of Electronics, Information and Communication Enginners), 1998, VOL.98,NO.138(OME98 24-33), PAGE.51-56, FIG.5, REF.13
JOURNAL NUMBER: S0532BBG
UNIVERSAL DECIMAL CLASSIFICATION: 621.383:535.35
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication

R-G-B Emitting Multi-Color Organic EL **Device.**
ABSTRACT: Recently, **organic electroluminescentdiode** (EL) diodes have been extensively studied for high intensity, high **efficiency** , **white** light emission, and multi- **color** emission. **Organic EL** diodes have been developed to exhibit novel device characteristics. In this report, multi-color EL...
?

14/3,K/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

7316148 INSPEC Abstract Number: B2002-08-7260D-009
Title: Optical characterization of OLED **displays with touch screens**
Author(s): Cropper, A.D.; Feldman, R.D.; **Siwinski, M.** ; Kilmer, K.
Author Affiliation: Eastman Kodak Co., Rochester, NY, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4464 p.344-51
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 2002 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(2002)4464L.344:OCOD;1-2
Material Identity Number: C574-2002-155
U.S. Copyright Clearance Center Code: 0277-786X/02/$15.00
Conference Title: Organic Light-Emitting Materials and Devices V
Conference Sponsor: SPIE
Conference Date: 30 July-1 Aug. 2001 Conference Location: San Diego, CA, USA
Language: English
Subfile: B

Title: Optical characterization of OLED **displays with touch screens**
Author(s): Cropper, A.D.; Feldman, R.D.; **Siwinski, M.** ; Kilmer, K.
...Abstract: a thin aspect ratio are all well understood physical characteristics of organic fight emitting diode (**OLED**) displays, an up-and-coming flat panel displays. Increasing numbers of applications of flat panel...

... describe the optical characteristics of mating a touch screen with a full-color active matrix **OLED** display. We will quantify the **OLED** optical properties with respect to touch screens with matte finishes and anti-reflective topcoats, and...
Identifiers: **OLED** displays with touch screens...

...full-color active matrix **OLED** display

14/3,K/2 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

06172678 E.I. No: EIP02437155864
Title: Optical characterization of OLED **displays with touch screens**
Author: Feldman, Rodney D.; **Siwinski, Michael** ; Kilmer, Kathleen; Cropper, A.D.
Corporate Source: Eastman Kodak Company, Rochester, NY 14650-1821, United States
Conference Title: Organic Light-Emitting Materials and Devices V
Conference Location: San Diego,CA, United States Conference Date: 20010730-20010801
E.I. Conference No.: 59972
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4464 2002. p 344-351
Publication Year: 2002
CODEN: PSISDG ISSN: 0277-786X
Language: English

Title: Optical characterization of OLED **displays with touch screens**
Author: Feldman, Rodney D.; **Siwinski, Michael** ; Kilmer, Kathleen; Cropper, A.D.

...Abstract: lower power consumption, and a thin aspect ratio are all well understood physical characteristics of **organic light emitting diode** (**OLED**) displays, an up-and-coming flat panel displays. Increasing numbers of applications of flat panel...

...describe the optical characteristics of mating a touch screen with a full-color active matrix **OLED** display. We will quantify the **OLED** optical properties with respect to touch screens with matte finishes and anti-reflective topcoats, and...

14/3,K/3 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences

04133739 INSIDE CONFERENCE ITEM ID: CN043405007
Optical characterization of OLED **displays with touch screens (4464-58)**
Cropper, A. D.; Feldman, R. D.; **Siwinski, M.** ; Kilmer, K.
CONFERENCE: Organic light-emitting materials and devices-Conference; 5th
PROCEEDINGS-SPIE THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, 2002 ; VOL 4464 P: 344-351
SPIE, 2002
ISSN: 0277-786X ISBN: 0819441783
LANGUAGE: English DOCUMENT TYPE: Conference Selected papers
CONFERENCE EDITOR(S): Kafafi, Z.
CONFERENCE SPONSOR: International Society for Optical Engineering
CONFERENCE LOCATION: San Diego, CA 2001; Jul (200107) (200107)

Optical characterization of OLED **displays with touch screens (4464-58)**
Cropper, A. D.; Feldman, R. D.; **Siwinski, M.** ; Kilmer, K.
DESCRIPTORS: organic light-emitting materials; SPIE; light-emitting devices; light emitting materials; **organic light emitting devices** ; light-emitting devices

```
File 344:Chinese Patents Abs Aug 1985-2003/Apr
         (c) 2003 European Patent Office
File 347:JAPIO Oct 1976-2003/Jul(Updated 031105)
         (c) 2003 JPO & JAPIO
File 348:EUROPEAN PATENTS 1978-2003/Nov W02
         (c) 2003 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20031113,UT=20031106
         (c) 2003 WIPO/Univentio
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200374
         (c) 2003  Thomson Derwent
? ds

Set     Items   Description
S1         19   AU=(SIWINSKI, M? OR SIWINSKI M?)
S2       8521   CO=(EASTMAN(W)KODAK()COMPANY)
S3         19   IDPAT S1 (sorted in duplicate/non-duplicate order)
S4         11   IDPAT S1 (primary/non-duplicate records only)
S5          2   S4 AND (IC=(G09G-003/32 OR G09G-005/00) OR OLED OR ORGANIC-
               (W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR DIODE? ?) OR ELECTROLU-
               MINESC? OR ELECTRO()LUMINESC? OR EL))
S6        202   S2 AND (IC=(G09G-003/32 OR G09G-005/00) OR OLED OR ORGANIC-
               (W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR DIODE? ?) OR ELECTROLU-
               MINESC? OR ELECTRO()LUMINESC? OR EL))
S7         67   S6 AND WHITE
S8         67   IDPAT (sorted in duplicate/non-duplicate order)
S9         67   IDPAT (primary/non-duplicate records only)
S10         0   S9 AND S4 NOT S5
S11        65   S7 AND (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RGB) NOT
                S5
S12        11   S11(S)WHITE(S)(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR -
               RGB)(S)S6
S13        11   IDPAT (sorted in duplicate/non-duplicate order)
S14       186   AU=(KIDO, J? OR KIDO J?)
S15     10780   AU=(KIMURA, M? OR KIMURA M?)
S16      5827   AU=(NAGAI, K? OR NAGAI K?)
S17         0   S14 AND S15 AND S16
S18        35   (S14 OR S15 OR S16) AND IC=(G09G-003/32 OR G09G-005/00)
S19         0   S18(S)WHITE(S)(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR -
               RGB)(S)(OLED OR ORGANIC(W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR
               DIODE? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL))
```

5/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.

015394033 **Image available**
WPI Acc No: 2003-456174/200343
XRPX Acc No: N03-362752
Power saving method for color organic electroluminescent **display of personal computer, involves converting color digital image into monochrome image using color of specific elements**
Patent Assignee: EASTMAN KODAK CO (EAST)
Inventor: **SIWINSKI M J**
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20020180723	A1	20021205	US 2001874147	A	20010605	200343	B

Priority Applications (No Type Date): US 2001874147 A 20010605
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020180723	A1		5	G09G-005/00	

Power saving method for color organic electroluminescent **display of personal computer, involves converting color digital image into monochrome image using color of...**
Inventor: **SIWINSKI M J**

Abstract (Basic):
... An INDEPENDENT CLAIM is included for color **organic electroluminescent** display...

...For saving power in color **organic electroluminescent** display panel used in electronic device such as personal computer (PC), personal digital assistant (PDA...
International Patent Class (Main): **G09G-005/00**

5/3,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.

015267764 **Image available**
WPI Acc No: 2003-328693/200331
XRPX Acc No: N03-262872
Color organic electroluminescent **display power saving method for personal computer, involves converting color digital image into monochrome image which is displayed using white light emitting elements of display**
Patent Assignee: EASTMAN KODAK CO (EAST)
Inventor: **SIWINSKI M J**
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20020186214	A1	20021212	US 2001874128	A	20010605	200331	B

Priority Applications (No Type Date): US 2001874128 A 20010605
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020186214	A1		6	G09G-005/00	

Color organic electroluminescent **display power saving method for personal computer, involves converting color digital image into monochrome image...**

Inventor: **SIWINSKI M J**

Abstract (Basic):

... An INDEPENDENT CLAIM is included for color **organic electroluminescent** display...

...For saving power in color **organic electroluminescent** flat panel display (claimed) such as **organic light emitting diodes** (OLEDs) used in personal computer, personal digital assistant, laptop computer, cellular telephone, etc...

International Patent Class (Main): **G09G-005/00**

?

13/3,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01640552
Desiccant structures for oled displays
Trockenmittelstrukturen fur oled Anzeigen
Structures deshydratants pour dispositifs d'affichage oled
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Cok, Ronald Steven, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Boroson, Michael Louis, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
O'Toole, Terrence Robert, Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)
PATENT (CC, No, Kind, Date): EP 1351323 A2 031008 (Basic)
APPLICATION (CC, No, Date): EP 2003075823 030324;
PRIORITY (CC, No, Date): US 116307 020404
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; HU; IE; IT; LI; LU; MC; NL; PT; SE; SI; SK; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO
INTERNATIONAL PATENT CLASS: H01L-051/20
ABSTRACT WORD COUNT: 63
NOTE:
Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200341	174
SPEC A	(English)	200341	4743
Total word count - document A			4917
Total word count - document B			0
Total word count - documents A + B			4917

...SPECIFICATION the first electrodes 18 is exposed.

Over the first electrodes and insulating layers are provided **red** , **green** , and **blue** -emitting **organic electroluminescent** (EL) elements, 19R, 19G, and 19B, respectively. Herein, the collection of **organic EL** elements may also be referred to as the **organic EL** layer The light-emitting pixel area is generally defined by the area of the first electrode 18 in contact with the **organic EL** elements. Over the **organic EL** layer is provided a transparent, common second electrode 30 that has sufficient optical transparency to allow transmission of the generated **red** , **green** , and **blue** light. Each first electrode in combination with its associated **organic EL** element and second electrode is herein referred to as an **OLED** element. A typical top-emitting **OLED** display device comprises an array of **OLED** elements wherein each **OLED** element emits **red** , **green** or **blue** . However, monochrome display devices are also known where the array of **OLED** elements emit the same **color** light, for example, **white** .

In operation, the thin-film transistors in TFT layer 14 allow current to flow between...light is patterned, and the other layers may be uniformly deposited over the entire device.

OLED devices of this invention can employ various well-known optical effects in order to enhance...,

...the display, providing a polarizing medium over the display, or providing colored, neutral density, or **color** conversion filters over the display. Filters, polarizers, and anti-glare or anti-reflection coatings may...

...the cover or as part of the cover. In another embodiment of this invention, the **OLED** elements may emit **white** light and a **RGB** filter array is provided over the **white** -emitting **OLED** elements to provide a full **color** display device.

13/3,K/2 (Item 2 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01624311
Organic electroluminescent device having stacked electroluminescent units
Organische elektrolumineszente Anordnung mit gestapelten elektrolumineszenten Elementen
Dispositif electroluminescent organique comportant des elements electroluminescents empiles
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Liao, Liang-Sheng L., c/o Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)
Tang, Ching Wan, c/o Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)
PATENT (CC, No, Kind, Date): EP 1339112 A2 030827 (Basic)
APPLICATION (CC, No, Date): EP 2003075309 030203;
PRIORITY (CC, No, Date): US 77270 020215
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; HU; IE; IT; LI; LU; MC; NL; PT; SE; SI; SK; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO
INTERNATIONAL PATENT CLASS: H01L-051/20
ABSTRACT WORD COUNT: 87
NOTE:
Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200335	339
SPEC A	(English)	200335	11969
Total word count - document A			12308
Total word count - document B			0
Total word count - documents A + B			12308

...SPECIFICATION or lifetimes. A few non-limiting examples are discussed below.

White-Emitting Devices
By using **RGB** stacks, this invention enables **white** light generation

at greatly improved efficiency and operational lifetime compared to **OLED** devices of the prior art. One application for this improved **white** light-producing, stacked **OLED** is in general purpose or area lighting, where high luminance originated from a large surface area is desirable. FIG. 7 illustrates an example of a **white** light-emitting structure that can be used as an area lighting device or lamp 350...

...cathode 240 and anode 210 of the lamp via electrical conductors 260. In this example, **organic EL** unit 220.1 emits **blue** light, **organic EL** unit 220.2 emits **green** light, and **organic EL** unit 220.3 emits **red** light. The intensity and exact hue of light emission from each **organic EL** unit is chosen so that they combine to yield **white** light, or nearly **white** light. Doped organic connectors 230.1 and 230.2 are as defined previously. There are many other combinations of **organic EL** units that can be used to yield light that appears **white** . For example, two-layer structures that emit **blue** and yellow light, or that emit **red** and cyan light, or that emit **green** and magenta light, can be used to generate **white** light. In all cases these units can be combined multiple times. For example, one can use several **RGB** stacks in a single device

Another application is in full **color** displays where **white** light is generated by each pixel and filtered using **RGB** filters. That is, an **RGB** filter is provided between the display and a viewer. This simplifies manufacturing because it is generally easier to apply a **RGB** filter after **OLED** device fabrication than to pattern **RGB** emitting pixels. While there are manufacturing advantages, this **RGB** filter method suffers greatly from lost efficiency since the filter wastes much of the generated light. A high efficiency **RGB** stack of this invention allows for the fabrication of a filtered **RGB** display that is not disadvantaged in terms of efficiency relative to a conventional patterned emissive **RGB** **OLED** of the prior art, and maintains the manufacturing advantage.

FIGS 8 and 9 illustrate a non-limiting example of a matrix array of **white** light-emitting stacked **OLED** devices that can be used to fabricate a full- **color** matrix display. FIG. 8 is a cutaway schematic showing one example of electrical circuitry that can used to independently activate each stacked **OLED** device (that is, each pixel). This matrix array is commonly referred to as an active...

...TFTs) for current control TC11, TC21, TC31, ..., TC12, TC22, TC23, TC31, TC32, TC33, ..., TCnm, stacked **OLED** devices EL11, EL21, EL31, ..., EL12, EL22, EL23, ..., EL31, EL32, EL33, ..., ELnm, capacitors C11, C21, C31...

...state. Thus, an electric current supplied from a power supply line Vdd flows in the **organic EL** pixel, which results in light emission.

FIG. 9 is a cross-sectional schematic diagram illustrating...

...color matrix display 600. Display 600 uses white light emission from an array of stacked **organic electroluminescent** devices (ELnm) and an array of **color** filters in registration with the devices. The **color** filters are situated between the devices and the viewer. Provided over transparent support 601 (typically...

...602 and 603, and the wiring, capacitors, and transistors necessary to drive the individual stacked **OLED** devices or pixels in the array. For clarity, the electrical wiring, capacitors, and transistors in...

...to reveal the anode pads. Provided over the anode pads and organic insulator 603 is **white** -light emitting organic layer 605 comprising a

stack of two or more **organic EL** units and doped organic connectors as taught in this invention, necessary to yield **white** light emission. For example, a stack of **red** , **green** , and **blue** -emitting units, or a stack of **blue** and yellow-emitting units can all be effective. These **organic EL** units can be deposited over the entire display device. This is followed by deposition of cathode 640, which is common to each stacked **OLED** device. When activated, **white** light is emitted through the transparent anode 610, transparent organic insulator, 602, and through the transparent substrate 601. The emission area of each stacked **OLED** device (pixel) is defined by the contact area with the anode. Provided on the surface of the transparent substrate opposite the matrix array of **white** light-emitting **organic electroluminescent** devices, is an array of **red** (651), **green** (652), and **blue** (653) filters that are positioned in registration with each pixel. Thus, in FIG. 9, **white** light generated by EL11 appears **red** , **white** light generated by EL12 appears **green** , and **white** light generated by EL13 appears **blue** . Materials and methods for depositing **color** filter arrays on glass substrates are well known in the art.

Color -Conversion Displays

Another application of this invention is in devices or displays that utilize blue...matrix array of stacked organic electroluminescent devices according to claim 8, wherein each device emits **white** light by stacking red , **green** , and **blue** -emitting **organic electroluminescent** units;

(b) means for independently electrically activating each device; and

(c) an array of red...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red** , **green** , and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...

...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red** , **green** , and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...layer.

The stacked organic electroluminescent device comprising at least three organic electroluminescent units such that **red** , **green** , and **blue** -emitting units are combined to yield **white** light.

The stacked organic electroluminescent device wherein the organic electroluminescent units emit essentially the same...

...CLAIMS matrix array of stacked organic electroluminescent devices according to claim 1, wherein each device emits **white** light by stacking **blue** and yellow-emitting **organic electroluminescent** units, or by stacking **green** and magenta-emitting **organic electroluminescent** units, or by stacking **red** and cyan-emitting **organic electroluminescent** units;

(b) means for independently electrically activating each device; and

(c) an array of red...

13/3,K/3 (Item 3 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

01578530

Digital/analog recording using near field optical imaging
Analog/Digital Aufzeichnung unter Verwendung der optischen Nahfeldabbildung
Enregistrement analogique/numerique par imagerie optique a champ proche
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Spoonhower, John P., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Patton, David Lynn, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Haile, Helen Cynthia et al (60522), Kodak Limited Patent, W92-3A, Headstone Drive, Harrow, Middlesex HA1 4TY, (GB)
PATENT (CC, No, Kind, Date): EP 1310950 A2 030514 (Basic)
APPLICATION (CC, No, Date): EP 2002079322 021017;
PRIORITY (CC, No, Date): US 45805 011029
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; SK; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: G11B-007/0045; G11B-007/20; G11B-007/24
ABSTRACT WORD COUNT: 126
NOTE:
Figure number on first page: 1A, 1B

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200320	321
SPEC A	(English)	200320	4180
Total word count - document A			4501
Total word count - document B			0
Total word count - documents A + B			4501

...SPECIFICATION means such as a softcopy display. The image 10 can be black and white or **color** . The softcopy display can be a CRT, **organic light emitting diode** (**OLED**) display, or other similar type device. Using near-field optics, the image 10 is formed...range capable of capturing the intensity variation in the original scene, unless simple black and **white** images are all that is required.
Referring now to Fig. 5a, the image(s) 10...

13/3,K/4 (Item 4 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01560937
Organic light emitting diode having an interface layer between the hole-transporting layer and the light-emitting layer
Organische Licht emittierende Diode mit einer Zwischenschicht zwischen der Locher transportierenden Schicht und der Licht emittierenden Schicht
Diode electroluminescente organique avec une couche intermediate entre la couche transporteuse de trous et la couche electroluminescente
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Liao, L.-S., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)

Madathil, J. K., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Klubek, K. P., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Tang, C. W., c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)
PATENT (CC, No, Kind, Date): EP 1298737 A2 030402 (Basic)
APPLICATION (CC, No, Date): EP 2002078794 020916;
PRIORITY (CC, No, Date): US 966618 010928
DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; SK; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H01L-051/20
ABSTRACT WORD COUNT: 111
NOTE:
Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200314	274
SPEC A	(English)	200314	3720
Total word count - document A			3994
Total word count - document B			0
Total word count - documents A + B			3994

...SPECIFICATION to the emissive dopant molecules. In a preferred embodiment, this invention can be used in **OLED** devices that emit **red** , **green** , or **blue** light, and all combinations thereof, including **white** light.
Organic materials useful for the electron-transporting layer 106 have been disclosed by Tang...

...CLAIMS or greater than that of the organic compound of the light-emitting layer.
2. The **organic light - emitting device** as in claim 1 wherein the light-emitting layer emits **blue** , **green** , **red** , or **white** light.
3. The organic light-emitting device as in claim 1 wherein the thickness of...

13/3,K/5 (Item 5 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01543232
White organic light-emitting devices with improved efficiency
Weisses Licht emittierende Vorrichtung mit verbessertem Wirkungsgrad
Dispositif d'emission de lumiere blanche avec un rendement ameliore
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Hatwar, Tukaram Kisan, c/o Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)

PATENT (CC, No, Kind, Date): EP 1286569 A1 030226 (Basic)
APPLICATION (CC, No, Date): EP 2002078223 020805;
PRIORITY (CC, No, Date): US 930050 010815
DESIGNATED STATES: DE; FR; GB
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H05B-033/14; H05B-033/22; H05B-033/28
ABSTRACT WORD COUNT: 144
NOTE:
Figure number on first page: 3

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200309	440
SPEC A	(English)	200309	6104
Total word count - document A			6544
Total word count - document B			0
Total word count - documents A + B			6544

...ABSTRACT A1

An organic light-emitting diode (**OLED**) device which produces substantially **white** light includes a substrate; an anode disposed over the substrate; and a hole injecting layer...

...transport layer disposed over the hole injecting layer; a light-emitting layer doped with a **blue** light-emitting compound, disposed directly on the hole transport layer; and an electron transport layer disposed over the **blue** light-emitting layer. The device further includes a cathode disposed over the electron transport layer...
...to an entire layer or a partial portion of a layer in contact with the **blue** light-emitting layer, the selective doping being with a compound which emits light in the...

...SPECIFICATION device in their US-A-4,769,292 and US-A-4,885,211.

Efficient **white** light producing **OLED** devices are considered as low cost alternative for several applications such as paper-thin light sources backlights in LCD displays, automotive dome lights and office lighting. **White** light producing **OLED** devices should be bright, efficient, and generally have Commission International d'Eclairage (CIE) chromaticity coordinates of about (0.33, 0.33). In any event, in accordance with this disclosure, **white** light is that light which is perceived by a user as having a **white color** .

The following patents and publications disclose the preparation of organic OLED devices capable of emitting...

...hole transport layer and an organic luminescent layer, and interposed between a pair of electrodes.

White light producing **OLED** devices have been reported before by J. Shi (US-A-5,683,823) wherein, the luminescent layer includes a **red** and **blue** light-emitting materials uniformly dispersed in a host emitting material. This device has good electroluminescent characteristics, but the concentration of the **red** and **blue** dopants are very small such as 0.12% and 0.25% of the host material...
...control during large-scale manufacturing.

Sato and others in JP 07,142,169 discloses an **OLED** device, capable of emitting **white** light, is made by sticking a **blue** light-emitting layer next to the hole transporting layer and followed by a **green** light-emitting layer having a region containing a **red** fluorescent layer.

Kido and others, in Science, Vol. 267, p. 1332 (1995) and in APL Vol.

64, p. 815 (1994) report a **white** light producing **OLED** device. In this device three emitter layers with different carrier transport properties, each emitting **blue** , **green** or **red** light, are used to generate **white** light.

Littman and others in US-A-5,405,709 disclose another white emitting device...

...red.

Recently, Deshpande and others, in Applied Physics Letters, vol. 75, p. 888 (1999) published **white** **OLED** device using **red** , **blue** and **green** luminescent layers separated by a hole blocking layer.

However, these OLED devices require very small...

...and which can be reproduced in manufacturing environment.

It has been found quite unexpectedly that **white** light producing **OLED** devices with high luminance efficiency and operational stability can be obtained by doping yellow dopant in the NPB hole transport layer, **blue** dopant in the TBADN host emission layer and **green** dopant in the Alq electron transport layer.

The object is achieved by an organic light independently;

3) the **white** **OLED** device can be used with pre-pattemed substrate with having R, G, B **color** filters to produce an full **color** device;

4) an OLED device which is easy to control blue, yellow and green dopant...as Device 2 except that 10 nm Alq layer was doped with 0.12% C545T **green** dopant then followed by 25 nm undoped Alq. This device has significantly improved luminance yield and CIEx,y coordinates similar to that device 2. Also noteworthy is the **green** emission peak around 520 nm as also is shown in the FIG. 8. This **green** portion was absent in the spectra of device 2. The device 3 overall has **white** **color** emission but with much higher luminance yield of that device 2. Thus, it was possible to produce **white** **color** with increased efficiency by **green** dopant in the Alq electron transport layer. The individual contribution of each of the **color** is particularly important, if **white** **OLED** light is used in combination with the R, G, B **color** filters to produce a full **color** **OLED** device. In turn, the individual R, G, B contributions to the full **color** **OLED** can be engineered by using the present invention.

Comparative Example 4

Device 4 was prepared...

...in the Alq electron transport

FIG. 9 shows the luminance yield as a function of **green** C545T dopant % into the Alq electron transport layer. Again the luminance efficiency of the **white** **OLED** can be increased without adversely affecting the **color** of the **white** emitting **OLED** .

Comparative Example 6

Device 6 has structure similar to FIG. 5. It was prepared following... 2% Rubrene. This device has overall white emission and efficiency similar to device 9.

The **white** **OLED** emission can be used to prepare a full **color** device using the R, G, B **color** filters. The **color** filters are deposited either on the substrate or the **white** **OLED** device. In this case, **white** **OLED** is used as a backlight. Generally R, G, B **color** filters are integrated on the substrate using the microlithograpy patterning. This technique of producing of full **color** light has several advantages over the precision shadow masking technology used for producing the full...

...Hseih describe the addressing methods of the TFT substrates. Some other techniques for preparing full **color** devices using the **white** OLEDs are

given in an article by P.F. Burrows and others, IEEE Trans. Electron... white light;

b) a plurality of colored filters corresponding to different ones of the selectable **OLED** devices such that when **white** light passes through such filter, a particular **color** will be produced; and

c) means for selecting OLED devices to cause them to produce...

13/3,K/6 (Item 6 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

01408944

Organic electroluminescent device with supplement cathode bus conductor

Organische electrolumineszente Vorrichtung mit einer zusatzlichen Kathodenbusleitung

Dispositif organique electroluminescent avec un conducteur de type bus cathodique supplementaire

PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201214), 343 State Street, Rochester, New York 14650-2201, (US), (Applicant designated States: all)

INVENTOR:
Van Slyke, Steven A., c/o Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)

PATENT (CC, No, Kind, Date): EP 1191593 A2 020327 (Basic)
APPLICATION (CC, No, Date): EP 2001203403 010910;
PRIORITY (CC, No, Date): US 667293 000922
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H01L-027/00
ABSTRACT WORD COUNT: 189
NOTE:
Figure number on first page: 8

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200213	1234
SPEC A	(English)	200213	6463
Total word count - document A			7697
Total word count - document B			0
Total word count - documents A + B			7697

...SPECIFICATION or device having only four cathodes and four anodes. Additionally, the drawings show a single **organic electroluminescent** (EL) medium layer which, in actual practice, can include several layers, for example, organic hole...

...hole-transporting layers, an organic light-emitting layer which may emit light of a single **color** or hue, or which can emit one of **red** , **green** , or **blue** light (R, G, B) by appropriate doping of an organic light-emitting host material with...

...organic luminescent dopant material at selected pixel positions, and an organic electron-transporting layer. The **organic electroluminescent** medium can also emit **white** light by appropriate choice of emitting

dopants. Alternatively, the **organic EL** medium layer can include one or more organic polymeric layers capable of light-emission.
The...

13/3,K/7 (Item 7 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

01403127
White organic electroluminescent devices with improved stability and efficiency
Weiss ausstrahlende organische Elektrolumineszensvorrichtung mit verbessertem Wirkungsgrad und verbesserter Stabilitat
Dispositif electroluminescent emettant de la lumiere blanche avec efficacite et stabilite ameliorees
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)
INVENTOR:
Hatwar, Tukaram K., Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Weber, Etienne Nicolas et al (91684), Kodak Industrie, Departement Brevets, CRT, Zone Industrielle, 71102 Chalon sur Saone Cedex, (FR)
PATENT (CC, No, Kind, Date): EP 1187235 A2 020313 (Basic)
APPLICATION (CC, No, Date): EP 2001203130 010817;
PRIORITY (CC, No, Date): US 651624 000830
DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; TR
EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI
INTERNATIONAL PATENT CLASS: H01L-051/20
ABSTRACT WORD COUNT: 142
NOTE:
Figure number on first page: 5

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200211	439
SPEC A	(English)	200211	5877
Total word count - document A			6316
Total word count - document B			0
Total word count - documents A + B			6316

...ABSTRACT A2
An organic light-emitting diode (**OLED**) device which produces substantially **white** light includes a substrate; an anode disposed over the substrate; and a hole-injecting layer...

...transport layer disposed over the hole-injecting layer; a light-emitting layer doped with a **blue** light-emitting compound, disposed directly on the hole transport layer; and an electron transport layer disposed over the **blue** light-emitting layer. The device further includes a cathode disposed over the electron transport layer...

...to an entire layer or a partial portion of a layer in contact with the **blue** light-emitting layer, the selective doping being with a compound which emits light in the...

...SPECIFICATION is described in US-A-4,769,292 and US-A-4,885,211.

Efficient **white** light producing **OLED** devices are considered low cost alternative for several applications such as paper-thin light source backlights in LCD displays, automotive dome lights, and office lighting. **White** light producing **OLED** devices should be bright, efficient, and generally have Commission International d'Eclairage (CIE) chromaticity coordinates of about (0.33, 0.33). In any event, in accordance with this disclosure, **white** light is that light which is perceived by a user as having a **white color** .

The following patents and publications disclose the preparation of organic OLED devices capable of emitting...

...hole transport layer and an organic luminescent layer, and interposed between a pair of electrodes.

White light producing **OLED** devices have been reported before by in US-A-5,683,823 wherein the luminescent layer includes a **red** and **blue** light-emitting materials uniformly dispersed in a host emitting material. This device has good electroluminescent characteristics, but the concentration of the **red** and **blue** dopants are very small such as 0.12% and 0.25% of the host material...

...control during large-scale manufacturing.

Sato and others in JP 07,142,169 discloses an **OLED** device capable of emitting **white** light made by sticking a **blue** light-emitting layer next to the hole transporting layer and followed by a **green** light-emitting layer having a region containing a **red** fluorescent layer.

Kido and others, in Science, Vol. 267, p. 1332 (1995) and in APL Vol. 64, p. 815 (1994), report a **white** light producing **OLED** device. In this device three emitter layers with different carrier transport properties, each emitting **blue** , **green** or **red** light, are used to generate **white** light.

US-A-5,405,709 discloses another white emitting device which is capable of...

...red.

Recently, Deshpande and others, in Applied Physics Letters, vol. 75, p. 888 (1999) published **white** **OLED** device using **red** , **blue** and **green** luminescent layers separated by a hole blocking layer.

However, these OLED devices require a very...

...and which can be reproduced in manufacturing environment.

It has been found quite unexpectedly that **white** light producing **OLED** devices with high luminance efficiency and operational stability can be obtained by doping yellow dopant in the NPB hole transport layer and **blue** dopant in the ADN host emission layer.

It has also been found that by doping...shows relative luminance change as a function of operation time for the five devices: (AA) **Blue** device, (AC) 0.5% doping into ETL layer, (AD) **White** **OLED** with 1.5 % rubrene doping in HTL layer; (AE) and (AF) **White** **OLED** devices with rubrene doping both in HTL and ETL layers.

A conventional light-emitting layer...rubrene concentration was increased from 0 to 5% in the hole transport NPB layer. The **blue** emission layer consists of 1.5% TBP doped in the ADN host. **White** **color** with CIE coordinates (0.33, 0.38) is obtained with luminance efficiency greater than 4...

...is about ' 1.5 - 2%. Thus, much higher concentrations of rubrene yellow dopant and TBP **blue** doping can be used. The luminance efficiency and the CIE coordinates as a function of...

...shown in Table 1. Device D has luminance yield of 4.3 cd/A and **color** chromaticity coordinates of CIE x,y = 0.33, 0.38 @20 mA/cm2) current density...

...this invention in that doping rubrene in the NPB hole transport layer adjacent to a **blue** light emission layer can produce **white** light **OLED**.

It was found that the thickness of the rubrene yellow doped region of the NPB...

...region of the NPB hole transport layer 341a should be in close contact with the **blue** luminescent layer 342 for obtaining high efficiency **white** light producing **OLED** devices as illustrated from the following Example 2.

Example 2
OLED Devices G, H, I...

...that the emission becomes confined to the blue emission layer.

It was found that a **white** producing **OLED** can also be made by doping yellow rubrene dopant into Alq electron transport layer adjacent to a **blue** light emission layer. FIG. 6 shows an organic **white** light-emitting **OLED** device 600. The layer numbers are the same as corresponding to FIG. 3. An organic **white** light-emitting structure 640 is formed between the anode 220 and a cathode 230. The **white** light-emitting structure 640 is comprised of, in sequence, an organic hole-transporting layer 341, an organic light-emitting layer 342 which is **blue** emitting layer comprising ADN host and TBP dopant, and an organic electron-transporting layer 343a...region of the Alq electron transport layer 343a should be in close contact with the **blue** luminescent layer 342 for obtaining high efficiency **white** light producing **OLED** devices. This is illustrated by the following Example 4.

Example 4
OLED devices S to...

...that is from the blue emission layer.

Another important feature of this invention is that **white** light can be produced by an **OLED** by doping rubrene both in the NPB hole transport layer 341a and in the Alq electron transport layer 343a, and **blue** emitting layer 342. These devices have significantly higher luminance yield and higher operational stability as...

...in either hole transport layer or the electron transport layer.

FIG. 9 shows an organic **white** light-emitting **OLED** device 900 wherein rubrene was doped both in the hole transport 341a and the electron...

...The numbers for other layers are the same as corresponding to FIG. 3. An organic **white** light-emitting structure 940 is formed between the anode 220 and a cathode 230. The **white** light-emitting structure 940 is comprised of, in sequence, an organic hole-transporting layer 341a doped with rubrene, an organic light-emitting layer 342 which is **blue** emitting layer comprising ADN host and TBP dopant, and an organic electron-transporting layer 343a...

...Table 5. Devices AE and AF have luminance yield of 5.3 cd/A and **color** chromaticity coordinates of CIE x,y = 0.35, 0.38 @20 mA/cm2 current density. This luminance efficiency is higher than the **white** **OLED** devices obtained by rubrene doping either in the NPB hole transport layer or in the...mA/cm2 current density. These devices are described in Example 5. Device AA is a **blue** device. Device AC and AD are **white**

devices obtained by doping rubrene into Alq electron transport layer and NPB hole transport layer, respectively. Devices AE and AF are also **white** devices, except that the yellow rubrene was doped both in the NPB hole transport layer...

...and the drive voltage. Thus, these devices have the highest operational stability among the five **OLED** devices. When rubrene was doped both in the NPB hole transport layer as well as Alq electron transport layer adjacent to the **blue** emission layer, the synergistic effect was such that significantly better operational stability and efficiency were obtained for the **white** **OLED** devices.

Thus, the **white** **OLED** devices of this invention prepared by doping rubrene into either NPB hole transport layer or...

...hole transport layer and the electron transport layer have significantly improved operational fade stability. These **OLED** devices have higher luminance yield and lower drive voltage. These **OLED** devices can be operated at higher current density with minimum degradation in the **color** coordinates and the luminance efficiency.

Other features of the invention are included below.

The OLED...

13/3,K/8 (Item 8 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

00988042

Compact image sensor with display integrally attached

Kompakter Bildsensor mit daran befestigter Bildanzeigevorrichtung

Capteur d'image compact attache a un dispositif d'affichage

PATENT ASSIGNEE:

EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Applicant designated States: all)

INVENTOR:

Meyers, Mark Marshall, Eastman Kodak Company, 343 State Street, Rochester, New York 14650-2201, (US)

LEGAL REPRESENTATIVE:

Lewandowsky, Klaus, Dipl.-Ing. et al (7581), Kodak Aktiengesellschaft, Patentabteilung, 70323 Stuttgart, (DE)

PATENT (CC, No, Kind, Date): EP 893915 A2 990127 (Basic)
EP 893915 A3 000105

APPLICATION (CC, No, Date): EP 98201979 980612;

PRIORITY (CC, No, Date): US 882446 970625

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: H04N-005/335; H04N-005/225; H04N-003/15

ABSTRACT WORD COUNT: 101

NOTE:

Figure number on first page: 1

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9904	654
SPEC A	(English)	9904	7165
Total word count - document A			7819
Total word count - document B			0
Total word count - documents A + B			7819

...SPECIFICATION display 302 is comprised of a number of emissive pixels 304 capable of outputting either **white** , **red** , **green** , or **blue** light for presenting a Gray scale or **color** image of the photographic scene being captured or reviewed for capture. These emissive pixels 304 can be electroluminescent materials or **organic light emitting diode** materials such as those described in U.S. Patents 5,151,629,titled, " **Blue** Emitting Internal Junction **Organic Electroluminescent** Device (I)" by VanSlyke, and 5,126,214, titled "Electroluminescent Element," by Tokailin, et al...

13/3,K/9 (Item 9 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00853461
White light-emitting electroluminescent devices
Weiss-ausstrahlende organische Elektrolumineszenzvorrichtungen
Dispositifs electroluminescents emettant de la lumiere blanche
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201212), 343 State Street, Rochester, New York 14650, (US), (Proprietor designated states: all)
INVENTOR:
Shi, Jianmin, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Tang, Ching Wan, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Wagner, Karl H., Dipl.-Ing. (12561), WAGNER & GEYER Patentanwalte Gewurzmuhlstrasse 5, 80538 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 786925 A2 970730 (Basic)
EP 786925 A3 970924
EP 786925 B1 020619
APPLICATION (CC, No, Date): EP 97200088 970113;
PRIORITY (CC, No, Date): US 592830 960126
DESIGNATED STATES: DE; FR; GB
INTERNATIONAL PATENT CLASS: H05B-033/14; C09K-011/06
ABSTRACT WORD COUNT: 68
NOTE:
Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	199707W5	269
CLAIMS B	(English)	200225	155
CLAIMS B	(German)	200225	153
CLAIMS B	(French)	200225	187
SPEC A	(English)	199707W5	4150
SPEC B	(English)	200225	3839
Total word count - document A			4420
Total word count - document B			4334
Total word count - documents A + B			8754

...SPECIFICATION a current conducting organic layer.

BACKGROUND OF THE INVENTION
The organic electroluminescent devices which emit **white** light from a current conducting organic layer have very important applications. The

applications of such a device include paper-thin light sources, a backlight for liquid crystal display, and full **color** displays achieved by combining the emitters with micropatterned **color** filters. The following patents and publications disclose the preparation of **organic** **EL** devices, capable of emitting **white** light, comprising a hole transporting layer and an organic luminescent layer, and interposed between a...

...electrodes.

Sato in JP 07,142,169 discloses an organic electroluminescent device, capable of emitting **white** light, is made by staking a **blue** light emitting layer next to the hole transporting layer and followed by a **green** light emitting layer having a region containing a **red** fluorescent dye.

Kido et al., in Science, Vol. 267, p. 1332, (1995), also in Appl. Phys. Lett. Vol. 64, p. 815, (1994), report a white light-emitting **organic** **electroluminescent** device. In this device, three emitter layers with different carrier transport properties, each emitting **blue** , **green** , or **red** light, are used to generate **white** light.

Littman et al. in U.S. Patent No. 5,405,709 discloses another emitting ...

...SPECIFICATION a current conducting organic layer.

BACKGROUND OF THE INVENTION

The organic electroluminescent devices which emit **white** light from a current conducting organic layer have very important applications. The applications of such a device include paper-thin light sources, a backlight for liquid crystal display, and full **color** displays achieved by combining the emitters with micropatterned **color** filters. The following patents and publications disclose the preparation of **organic** **EL** devices, capable of emitting **white** light, comprising a hole transporting layer and an organic luminescent layer, and interposed between a...

...electrodes.

Sato in JP 07,142,169 discloses an organic electroluminescent device, capable of emitting **white** light, is made by staking a **blue** light emitting layer next to the hole transporting layer and followed by a **green** light emitting layer having a region containing a **red** fluorescent dye.

Kido et al., in Science, Vol. 267, p. 1332, (1995), also in Appl. Phys. Lett. Vol. 64, p. 815, (1994), report a white light-emitting **organic** **electroluminescent** device. In this device, three emitter layers with different carrier transport properties, each emitting **blue** , **green** , or **red** light, are used to generate **white** light.

Littman et al. in U.S. Patent No. 5,405,709 discloses another emitting ...

...extended abstract, 8 - 13 October 1995, Chicago, USA, pages 1316-1317, XP002035633, "White and colored **organic** **electroluminescent** devices for backlights", report thin-film **organic** **electroluminescent** (EL) devices having, in a first approach, a thin layer of a **blue** -emitting species, 2-naphthyl-4,5-bis(4-methoxyphenyl)-1,3-oxazole (denoted NAPOXA), sandwiched...

...bis(triphenyl)diamine, hole transporter) and AlQ (tris(8-hydroxyquinoline)aluminum, electron transporter) to produce **white** -light emission. In one example of this first approach the organic dye DCM 1 was...

13/3,K/10 (Item 10 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00670077
White light emitting internal junction organic electroluminescent device.
Weiss ausstrahlende organische Elektrolumineszensvorrichtung mit innerem Zonenubergang.
Dispositif electroluminescent emettant de la lumiere blanche avec jonction interne.
PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201214), 343 State Street, Rochester, New York 14650-2201, (US), (applicant designated states: DE;FR;GB)
INVENTOR:
Littman, Jon Eric, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
VanSlyke, Steven Arland, c/o Eastman Kodak Company, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Parent, Yves et al (17681), Kodak-Pathe Departement Brevets et Licences Centre de Recherches et de Technologie Zone Industrielle, F-71102 Chalon-sur-Saone Cedex, (FR)
PATENT (CC, No, Kind, Date): EP 643549 A1 950315 (Basic)
APPLICATION (CC, No, Date): EP 94420238 940905;
PRIORITY (CC, No, Date): US 121712 930913
DESIGNATED STATES: DE; FR; GB
INTERNATIONAL PATENT CLASS: H05B-033/14; C09K-011/06;
ABSTRACT WORD COUNT: 186

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	EPAB95	499
SPEC A	(English)	EPAB95	9529
Total word count - document A			10028
Total word count - document B			0
Total word count - documents A + B			10028

...SPECIFICATION the hole injecting and transporting zone.
ADVANTAGEOUS EFFECT OF THE INVENTION
The white light emitting **organic electroluminescent** device of the invention requires no patterning for its fabrication and can be advantageously employed with a readily available **color** filter array to produce full **color** flat panel displays.
BRIEF DESCRIPTION OF THE DRAWING
FIG. 1 is a schematic diagram of...devices of this invention.
It is possible to produce an organic electroluminescent device that emits **white** light by combining fluorescent materials that emit broad band **red** light and broad band **blue** light because both the **red** and **blue** light emitters also emit substantial amounts of **green** light. Thus, **red** and **blue** fluorescing materials can be combined in appropriate concentrations with a single host material in a single layer to produce emitted **white** light. Preferably, the **red** and **blue** light emitting materials are each included with a host material in two individual layers close...

...the hole transporting layer. In either the single layer or double layer format, the neutral **color** balance resulting in **white** light emission

is controlled by the relative concentrations of the **red** and **blue** light emitting materials; the concentrations of each required depend on several factors, including the relative...33 and Y = 0.34.

This result demonstrates the production of white light by an **organic electroluminescent** device comprising a combination of fluorescent materials that emit broad band **red** light and broad band **blue** light, in accordance with the present invention.

Other features of the invention are included below...

13/3,K/11 (Item 11 from file: 348)

DIALOG(R)File 348:EUROPEAN PATENTS

00532353

Organic electroluminescent multicolor image display device
Organische elektrolumineszierende Mehrfarbbildanzeigevorrichtung
Dispositif d'affichage electroluminescent organique a image multicolore

PATENT ASSIGNEE:
EASTMAN KODAK COMPANY, (201214), 343 State Street, Rochester, New York 14650-2201, (US), (applicant designated states: BE;DE;FR;GB;NL)
INVENTOR:
Tang, Ching Wan, c/o EASTMAN KODAK COMPANY, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Williams, David James, c/o EASTMAN KODAK COMPANY, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
Chang, Jack Che-Man, c/o EASTMAN KODAK COMPANY, Patent Legal Staff, 343 State Street, Rochester, New York 14650-2201, (US)
LEGAL REPRESENTATIVE:
Brandes, Jurgen, Dr. (2386), Wuesthoff & Wuesthoff Patent- und Rechtsanwalte Schweigerstrasse 2, 81541 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 550063 A2 930707 (Basic)
EP 550063 A3 940126
EP 550063 B1 970212
APPLICATION (CC, No, Date): EP 92122113 921229;
PRIORITY (CC, No, Date): US 814553 911230
DESIGNATED STATES (Pub A): AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE; (Pub B): BE; DE; FR; GB; NL
INTERNATIONAL PATENT CLASS: H05B-033/14; H05B-033/26; C09K-011/06;
ABSTRACT WORD COUNT: 175

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	EPAB97	1226
CLAIMS B	(German)	EPAB97	1340
CLAIMS B	(French)	EPAB97	1319
SPEC B	(English)	EPAB97	10756
Total word count - document A			0
Total word count - document B			14641
Total word count - documents A + B			14641

...SPECIFICATION electroluminescent image display devices of the invention are also more efficient than devices that emit **white** light and depend on a patterned **color** filter array for a multicolor imaging capability. Assuming an ideal system in which **white** light is emitted that is uniform in intensity throughout the visible spectrum and **color** filter sub-pixels are employed each of which transmit all light in one third of ...

...absorb all light received in the remainder of the visible spectrum (that is, an ideal **color** filter array), it is apparent that two thirds of the light emitted is internally absorbed and emission efficiency is necessarily limited to only one third that possible with the **color** filter array absent. In other words, superimposing a multicolor image display capability on a **white** emitter by the use of a **color** filter array reduces emission efficiency by two thirds in an ideal system. In actual implementation...light stimulates fluorescent emission in the green or red.

A very significant advantage of absorbing **blue** light emission from the organic EL medium and reemitting longer wavelength, **green** or **red** , light by fluorescence is that the efficiency of light emission can be very much superior to that achieved employing a **color** filter array in combination with a **white** light emitting **organic EL** medium. In the latter arrangement a theoretical maximum efficiency of only 33 percent is possible, since each sub-pixel of the **color** filter array absorbs and does not transmit two-thirds of the photons it receives. Further, aside from efficiency losses due to the **color** filter array, it is to be noted that the **organic EL** medium cannot be optimized to emit in any one portion of the visible spectrum, but...

...The efficiency of the present invention is controlled by (a) the efficiency of emission of **blue** light by the organic EL medium, (b) the efficiency with which the **blue** light is absorbed by the fluorescent media, and (c) the efficiency with which fluorescent media is stimulated to emit longer wavelength light. Considering (a) first, it is apparent that the **blue** emitting organic EL medium employed in the device 100 can be selected from a variety...

...highly efficient materials that would be highly inefficient in providing emission in each of the **blue** , **green** and **red** portions of the spectrum (that is, in providing **white** light emission). Turning to (b), high levels of efficiency can be realized in absorbing **blue** light emitted by the **organic EL** medium. There is no reason in theory why 100% of the **blue** light emitted can not be absorbed by the fluorescent medium. It is contemplated that in all instances at least 50% and preferably at least 80% of **blue** light emitted in the **green** and **red** sub-pixels can be absorbed. Turning to (c), a variety of fluorescent materials are known...

...in excess of 80% of light absorption are contemplated. Thus, within readily attainable levels of **blue** light absorption and longer wavelength fluorescence efficiencies, the **green** and **red** sub-pixels are capable of delivering to the viewer substantially greater than half the number of photons received from the **blue** emitting **organic EL** medium. For example, assuming an absorption efficiency of 80% and a fluorescence efficiency of 80%, both of which are readily attainable, 64% of the photons received from the **organic EL** medium are transmitted to the viewer in areas containing the fluorescent medium. In the **blue** sub-pixel areas, the efficiency is approximately 100%, since light absorption in the transparent electrode...

?

File 9:Business & Industry(R) Jul/1994-2003/Nov 18
(c) 2003 Resp. DB Svcs.
File 15:ABI/Inform(R) 1971-2003/Nov 18
(c) 2003 ProQuest Info&Learning
File 16:Gale Group PROMT(R) 1990-2003/Nov 18
(c) 2003 The Gale Group
File 20:Dialog Global Reporter 1997-2003/Nov 19
(c) 2003 The Dialog Corp.
File 47:Gale Group Magazine DB(TM) 1959-2003/Nov 18
(c) 2003 The Gale group
File 75:TGG Management Contents(R) 86-2003/Nov W2
(c) 2003 The Gale Group
File 80:TGG Aerospace/Def.Mkts(R) 1986-2003/Nov 18
(c) 2003 The Gale Group
File 88:Gale Group Business A.R.T.S. 1976-2003/Nov 17
(c) 2003 The Gale Group
File 98:General Sci Abs/Full-Text 1984-2003/Oct
(c) 2003 The HW Wilson Co.
File 112:UBM Industry News 1998-2003/Nov 19
(c) 2003 United Business Media
File 141:Readers Guide 1983-2003/Oct
(c) 2003 The HW Wilson Co
File 148:Gale Group Trade & Industry DB 1976-2003/Nov 19
(c)2003 The Gale Group
File 160:Gale Group PROMT(R) 1972-1989
(c) 1999 The Gale Group
File 275:Gale Group Computer DB(TM) 1983-2003/Nov 18
(c) 2003 The Gale Group
File 264:DIALOG Defense Newsletters 1989-2003/Nov 18
(c) 2003 The Dialog Corp.
File 369:New Scientist 1994-2003/Nov W2
(c) 2003 Reed Business Information Ltd.
File 484:Periodical Abs Plustext 1986-2003/Nov W2
(c) 2003 ProQuest
File 553:Wilson Bus. Abs. FullText 1982-2003/Oct
(c) 2003 The HW Wilson Co
File 570:Gale Group MARS(R) 1984-2003/Nov 19
(c) 2003 The Gale Group
File 608:KR/T Bus.News. 1992-2003/Nov 19
(c)2003 Knight Ridder/Tribune Bus News
File 620:EIU:Viewswire 2003/Nov 18
(c) 2003 Economist Intelligence Unit
File 613:PR Newswire 1999-2003/Nov 19
(c) 2003 PR Newswire Association Inc
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Nov 19
(c) 2003 The Gale Group
File 623:Business Week 1985-2003/Nov 18
(c) 2003 The McGraw-Hill Companies Inc
File 624:McGraw-Hill Publications 1985-2003/Nov 18
(c) 2003 McGraw-Hill Co. Inc
File 634:San Jose Mercury Jun 1985-2003/Nov 18
(c) 2003 San Jose Mercury News
File 635:Business Dateline(R) 1985-2003/Nov 18
(c) 2003 ProQuest Info&Learning
File 636:Gale Group Newsletter DB(TM) 1987-2003/Nov 18
(c) 2003 The Gale Group
File 647:CMP Computer Fulltext 1988-2003/Nov W3
(c) 2003 CMP Media, LLC
File 674:Computer News Fulltext 1989-2003/Nov W2
(c) 2003 IDG Communications
File 810:Business Wire 1986-1999/Feb 28

(c) 1999 Business Wire
File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc
? ds

Set	Items	Description
S1	7286	OLED OR ORGANIC(W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR DIODE? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2	35379	WHITE(5N)(BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING)(3N)(POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?))(5N)(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR ...
S3	28	S1(15N)S2
S4	13	RD S3 (unique items)
S5	7	S4 NOT PY>2001
S6	0	AU=(SIWINSKI, M? OR SIWINSKI M?)
S7	3048	WHITE(7N)COMPAR?(7N)(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RED()BLUE()GREEN OR RGB)
S8	0	S1(15N)S7
S9	2097	S1(15N)(WHITE(10N)BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING)(3N)(POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?)(10N)(COLOR OR COLOUR OR RED OR GREEN OR ...
S10	1249	S9 NOT (S5 OR PY>2001)
S11	527	RD S10 (unique items)
S12	4	S11(15N)(WHITE(10N)(COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RED()BLUE()GREEN OR RGB))

5/3,K/1 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

08646045 Supplier Number: 74797908 (USE FORMAT 7 FOR FULLTEXT)
SID tech sessions to address materials, processes, early apps -- Researchers plant seeds for organic LED growth.(Industry Trend or Event)
Lieberman, David
Electronic Engineering Times, p65
May 21, 2001
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1692

... CCM), builds on work previously reported by Idemitsu and Eastman Kodak. It colorizes a monochrome (**blue**) **OLED** by placing fluorescent materials above each pixel in **red** , **blue** and **green** triads or stripes.
"This approach allows **better** performance than **white** displays with **color** filters on top because no light is lost through filter absorption," the team will report...

5/3,K/2 (Item 2 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

07290762 Supplier Number: 61848569 (USE FORMAT 7 FOR FULLTEXT)
Covion and eMagin Team to Develop and Commercialize OLED Display Materials.
Business Wire, p1174
May 2, 2000
Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 900

... drive schemes, and systems integration. eMagin was the world's first company to demonstrate an **OLED** -on-Silicon video display and has demonstrated the world's most **efficient** full- **color** spectrum **white** OLEDs. eMagin's work with Covion will supplement its current efforts with Eastman Kodak and...

5/3,K/3 (Item 3 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

06456105 Supplier Number: 55090390 (USE FORMAT 7 FOR FULLTEXT)
Microdisplays' Performance, High-Resolution Draw Industry Attention At SID '99.
Ajluni, Cheryl
Electronic Design, v47, n13, p29
June 28, 1999
Language: English Record Type: Fulltext Abstract
Document Type: Magazine/Journal; Trade
Word Count: 607

... host of new technological developments which represent major milestones in the effort to develop full- **color** , high-resolution, power- **efficient** microdisplays.
One such announcement--a high- **efficiency** **white** -emitting **organic**

light - emitting diode (OLED)-comes from FED Corp., Hopewell Junction, N.Y. The company's new device purportedly is...

5/3,K/4 (Item 4 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)
(c) 2003 The Gale Group. All rts. reserv.

06224992 Supplier Number: 54234137 (USE FORMAT 7 FOR FULLTEXT)
Display conference to detail advances for plastic light emitters -- Organic LEDs ramped for low-cost displays. (Company Business and Marketing)
Lieberman, David
Electronic Engineering Times, p59(1)
March 29, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1125

... Tohoku Pioneer Electric Corp. (Yamagata, Japan) will report on Pioneer's development of a passive **OLED** : a full- **color** , 5.2-inch, 1/4-VGA display delivering a **white** peak luminance of **more** than 150 nits with a power dissipation of 6 W.
At SID, the **OLED** will also strut its stuff in several presentations by American, Japanese and Chinese academics with...

5/3,K/5 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2003 The Dialog Corp. All rts. reserv.

05362595 (USE FORMAT 7 OR 9 FOR FULLTEXT)
REMINDER/Planar Systems to Exhibit High Performance Display Technology at Society for Information Display Annual Event
BUSINESS WIRE
May 18, 1999
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 584

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... annual event. The presentations will cover advancements in Planar's miniature AMEL displays and improved **white** phosphors for **better color** in TFEL displays. In addition, Planar has participated in research on the emerging **OLED** technology that will be presented during the Symposium.
WHERE: Society for Information Display
1999 International...

5/3,K/6 (Item 2 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2003 The Dialog Corp. All rts. reserv.

05155466 (USE FORMAT 7 OR 9 FOR FULLTEXT)
ADVISORY/Planar Systems to Exhibit High Performance Display Technology at Society for Information Display Annual Event
BUSINESS WIRE
April 30, 1999
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 556

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... annual event. The presentations will cover advancements in Planar's miniature AMEL displays and improved **white** phosphors for **better** **color** in TFEL displays. In addition, Planar has participated in research on the emerging **OLED** technology that will be presented during the Symposium. WHERE: Society for Information Display 1999 International...

5/3,K/7 (Item 1 from file: 647)
DIALOG(R)File 647:CMP Computer Fulltext

01236957 CMP ACCESSION NUMBER: EET20010521S0050
SID tech sessions to address materials, processes, early apps - Researchers plant seeds for organic LED growth
David Lieberman
ELECTRONIC ENGINEERING TIMES, 2001, n 1167, PG65
PUBLICATION DATE: 010521
JOURNAL CODE: EET LANGUAGE: English
RECORD TYPE: Fulltext
SECTION HEADING: TECHNOLOGY
WORD COUNT: 1563

... CCM), builds on work previously reported by Idemitsu and Eastman Kodak. It colorizes a monochrome (**blue**) **OLED** by placing fluorescent materials above each pixel in **red** , **blue** and **green** triads or stripes.

"This approach allows **better** performance than **white** displays with **color** filters on top because no light is lost through filter absorption," the team will report...
?

12/3,K/1 (Item 1 from file: 9)
DIALOG(R)File 9:Business & Industry(R)

3322122 Supplier Number: 03322122 (USE FORMAT 7 OR 9 FOR FULLTEXT)
OLED/CMOS combo opens a new world of microdisplay: lightweight organic light-emitting diodes are being combined with CMOS silicon technology to enable small displays on head-worn and hand-held devices. (Microdisplays)
(New generation of microdisplays features combination of organic light-emitting diode technology and complementary metal oxide semiconductor silicon technology)
Laser Focus World, v 37, n 12, p 55(3)
December 2001
DOCUMENT TYPE: Journal ISSN: 1043-8092 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1453

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...a different but similar structure and materials to create large arrays of top-emitting full- **color** -spectrum **white** -light diodes.

(FIGURE 2 OMITTED)
In an **OLED** microdisplay, a stack of thin solid organic films totaling less than 1 gm is applied...

12/3,K/2 (Item 1 from file: 16)
DIALOG(R)File 16:Gale Group PROMT(R)

09314098 Supplier Number: 81139793 (USE FORMAT 7 FOR FULLTEXT)
OLED/CMOS combo opens a new world of microdisplay: lightweight organic light-emitting diodes are being combined with CMOS silicon technology to enable small displays on head-worn and hand-held devices. (Microdisplays).
Jones, Susan K.; Howard, Webster E.
Laser Focus World, v37, n12, p55(3)
Dec, 2001
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1634

... a different but similar structure and materials to create large arrays of top-emitting full- **color** -spectrum **white** -light diodes.
(FIGURE 2 OMITTED)
In an **OLED** microdisplay, a stack of thin solid organic films totaling less than 1 gm is applied...

12/3,K/3 (Item 1 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

10810333 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Covion and eMagin Team to Develop and Commercialize OLED Display Materials
BUSINESS WIRE
May 02, 2000
JOURNAL CODE: WBWE LANGUAGE: English RECORD TYPE: FULLTEXT

WORD COUNT: 921

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... drive schemes, and systems integration. eMagin was the world's first company to demonstrate an **OLED** -on-Silicon video display and has demonstrated the world's most **efficient** full- **color** spectrum **white** OLEDs. eMagin's work with Covion will supplement its current efforts with Eastman Kodak and...

12/3,K/4 (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB

10907717 SUPPLIER NUMBER: 54234137 (USE FORMAT 7 OR 9 FOR FULL TEXT)
Display conference to detail advances for plastic light emitters -- Organic LEDs ramped for low-cost displays.(Company Business and Marketing)
Lieberman, David
Electronic Engineering Times, 59(1)
March 29, 1999
ISSN: 0192-1541 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1235 LINE COUNT: 00101

... Corp. (Yamagata, Japan) will report on Pioneer's development of a passive OLED: a full- **color** , 5.2-inch, 1/4-VGA display delivering a **white** peak luminance of **more** than 150 nits with a power dissipation of 6 W.
At SID, the OLED will..

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File 344:Chinese Patents Abs Aug 1985-2003/Apr
         (c) 2003 European Patent Office
File 347:JAPIO Oct 1976-2003/Jul(Updated 031105)
         (c) 2003 JPO & JAPIO
File 350:Derwent WPIX 1963-2003/UD,UM &UP=200374
         (c) 2003  Thomson Derwent
? ds

Set     Items   Description
S1      11125   OLED OR ORGANIC(W)(LED OR LIGHT()EMIT?()(DEVICE? ? OR DIOD-
             E? ?) OR ELECTROLUMINESC? OR ELECTRO()LUMINESC? OR EL)
S2     126971   WHITE
S3    5219350   BETTER OR EFFICIEN? OR EFFECTIVE OR HIGHER OR LOWER OR MORE
              OR LESS OR GREATER OR LESSER OR (SAVE OR SAVES OR SAVING)(3N-
             )(POWER OR ELECTRICITY OR ENERGY OR CHARGE OR BATTERY?)
S4     637395   (COLOR OR COLOUR OR RED OR GREEN OR BLUE OR RED()GREEN()BL-
             UE OR RGB)
S5         86   S1 AND S2 AND S3 AND S4
S6          5   S1 AND S2(5W)S3(5W)S4
S7          5   IDPAT (sorted in duplicate/non-duplicate order)
S8          5   IDPAT (primary/non-duplicate records only)
S9         14   S1 AND S2(5N)S3(5N)S4 NOT S8
S10        14   IDPAT (sorted in duplicate/non-duplicate order)
S11        13   IDPAT (primary/non-duplicate records only)
S12         1   S5 AND IC=(G09G-003/32 OR G09G-005/00) NOT (S8 OR S11)
```

8/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015446411 **Image available**
WPI Acc No: 2003-508553/200348
XRAM Acc No: C03-136317
XRPX Acc No: N03-403795
Organic electroluminescence **elements for e.g. display devices, back lights, electrophotography, sign boards, have aromatic hydrocarbon or heterocyclic compounds and amine derivatives in light emitting layers**
Patent Assignee: FUJI PHOTO FILM CO LTD (FUJF)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2003022893	A	20030124	JP 2001206636	A	20010706	200348	B

Priority Applications (No Type Date): JP 2001206636 A 20010706
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2003022893	A		49	H05B-033/14	

Organic electroluminescence **elements for e.g. display devices, back lights, electrophotography, sign boards, have aromatic hydrocarbon or...**

Abstract (Basic):
... The element emits **white** or **blue** lights with **higher** purity, having improved durability...

8/3,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015400730 **Image available**
WPI Acc No: 2003-462870/200344
XRAM Acc No: C03-123670
XRPX Acc No: N03-368390
Organic electroluminescent **light-emitting element for light source of display device has organic light-emitting layer containing substituted pyridinyl imidazole, provided between electrodes**
Patent Assignee: MATAKA S (MATA-I); MATSUSHITA DENKI SANGYO KK (MATU); SOEDA Y (SOED-I); TISU T M (TISU-I)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2003133072	A	20030509	JP 2001327275	A	20011025	200344	B

Priority Applications (No Type Date): JP 2001327275 A 20011025
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2003133072	A		20	H05B-033/14	

Organic electroluminescent **light-emitting element for light source of display device has organic light-emitting layer containing...**

Abstract (Basic):
... The **organic electroluminescent** light-emitting element has an organic light-emitting layer (4) which has light-emission area...
... The **organic electroluminescent** light-emitting element has an

organic light-emitting layer (4) which has light-emission area...

...The light-emitting element emits **white** and **blue** luminescence **efficiently** and the continuous actuation stability is improved, hence the brightness emission for long period of...

...The figure shows the principal sectional drawing of the **organic electroluminescent** light-emitting element...

Extension Abstract:

... 0.5 nm/second in the vacuum to film thickness of 200 nm and an **organic electroluminescent** light-emitting element was obtained. The light-emitting element had excellent initial-stage brightness and...

8/3,K/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

012250089 **Image available**

WPI Acc No: 1999-056196/199905

XRAM Acc No: C99-016935

XRPX Acc No: N99-042715

Organic electroluminescent **device - comprise a hole transporting layer, based on (aza)benzothioxanthene, and electron transporting layer between an anode and a cathode which are formed on a substrate**

Patent Assignee: MITSUBISHI CHEM CORP (MITU)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 10308278	A	19981117	JP 97118107	A	19970508	199905	B

Priority Applications (No Type Date): JP 97118107 A 19970508

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 10308278	A		18	H05B-033/14	

Organic electroluminescent **device...**

...Abstract (Basic): The **organic EL** device comprises a hole transporting layer and an electron transporting layer interposed between an anode...

...USE - The **organic EL** device is used in thin film type devices emitting white colour light...

...ADVANTAGE - **White colour** luminescence device, having improvedly **higher colour** purity and stable luminescence spectrum, can be obtained...

8/3,K/4 (Item 4 from file: 347)

DIALOG(R)File 347:JAPIO

05144673 **Image available**

WHITE FLUORESCENCE CONVERSION FILM AND WHITE LIGHT EMITTING ELEMENT CONTAINING THE FILM

PUB. NO.: 08-100173 [JP 8100173 A]

PUBLISHED: April 16, 1996 (19960416)

INVENTOR(s): IKEDA HIDEJI
TSUCHIYA JUN
APPLICANT(s): IDEMITSU KOSAN CO LTD [330172] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 06-237558 [JP 94237558]
FILED: September 30, 1994 (19940930)

ABSTRACT

... the subject conversion film capable of converting the emission color of a blue light-emitting **organic EL** element into **white color** in high **efficiency** , producible at a low cost, enabling the reduction of the size and the thickness of...

8/3,K/5 (Item 5 from file: 347)
DIALOG(R)File 347:JAPIO

04797660 **Image available**
ORGANIC ELECTROLUMINESCENCE ELEMENT

PUB. NO.: 07-090260 [JP 7090260 A]
PUBLISHED: April 04, 1995 (19950404)
INVENTOR(s): KIDO JUNJI
APPLICANT(s): SUMITOMO ELECTRIC IND LTD [000213] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 06-112502 [JP 94112502]
FILED: May 26, 1994 (19940526)

ORGANIC ELECTROLUMINESCENCE ELEMENT

ABSTRACT

... molecularly dispersed pigment, capable of emitting blue color light, three primary color multicolor light or **white color** light, excellent in luminous **efficiency** , luminous brightness and stability, and useful for illumination, display, etc...

11/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015585866 **Image available**
WPI Acc No: 2003-648021/200362
XRAM Acc No: C03-177451
XRPX Acc No: N03-515599
Stacked organic electroluminescent **device for use in lamp for area lighting, has anode, cathode,** organic electroluminescent **units between anode and cathode, and doped organic connector between each adjacent** organic electroluminescent **unit**
Patent Assignee: EASTMAN KODAK CO (EAST)
Inventor: LIAO L L; TANG C W
Number of Countries: 032 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1339112	A2	20030827	EP 200375309	A	20030203	200362	B
US 20030170491	A1	20030911	US 200277270	A	20020215	200367	

Priority Applications (No Type Date): US 200277270 A 20020215
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1339112	A2	E	32	H01L-051/20	
	Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR				
US 20030170491 A1				H05B-033/00	

Stacked organic electroluminescent **device for use in lamp for area lighting, has anode, cathode,** organic electroluminescent **units between anode and cathode, and doped organic connector between each adjacent** organic electroluminescent **unit**

Abstract (Basic):
... A stacked **organic electroluminescent** (EL) device comprises anode (210), cathode (240), **organic EL** units (220.1 - 220.N) between anode and cathode, and doped organic connector (230.1=230.(N-1)) disposed between each adjacent **organic EL** unit.
... a) a lamp for area lighting comprising: transparent substrate; and stacked **organic electroluminescent** device emitting white light; and...

...b) a full-color matrix display observable by viewer comprising: matrix array of stacked **organic EL** devices; mechanism die independently electrically activating each device; and array of red, green, and blue ...
...The device enables stacked **organic light emitting diode (OLED)** (200) to function without requiring intraelectrodes to lower optical losses, and provides significantly improved luminance...

...output, can be operated with single voltage source, provides new way to adjust the emission **color** , and produces high **efficiency white** electroluminescence...

...The figure depicts a schematic cross sectional view of a stacked **OLED** having stacked **organic EL** units and doped organic connector in between each of the **organic EL** units...

... **Organic light emitting diode** (200...

... **Organic EL** units (220.1 - 220.N
Technology Focus:
... Preferred Component: The **organic EL** units comprise small molecule materials, hole-transporting layer and electron-transporting layer, polymeric materials, and...

11/3,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015055596 **Image available**
WPI Acc No: 2003-116112/200311
XRAM Acc No: C03-030054
XRPX Acc No: N03-092585
Organic electroluminescent **device simultaneously exhibits blue light emission and orange light emission on same light emitting in-plane and achieves white light emission which has superior color purity**
Patent Assignee: FUJI PHOTO FILM CO LTD (FUJF); TOYOTA CHUO KENKYUSHO KK (TOYW)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2002329578	A	20021115	JP 2001133598	A	20010427	200311	B

Priority Applications (No Type Date): JP 2001133598 A 20010427
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2002329578	A		20	H05B-033/14	

Organic electroluminescent **device simultaneously exhibits blue light emission and orange light emission on same light emitting in...**

Abstract (Basic):
... Containing the fluorescent pigment in the compound of formula (I) yields a blue **organic electroluminescent** device having high efficiency and prolonged life. A combination of the compound of formula (I...

...emission and orange light emission on the same light emitting in-plane. The result achieves **white** light emission having superior **color** purity to yield with high **efficiency** a **white** light emitting device having high durability...

11/3,K/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013497075 **Image available**
WPI Acc No: 2000-669016/200065
XRPX Acc No: N00-496043
Organic electroluminescent **light emitting device for use as back light of non-spontaneous light display device, emits different white light by combining red, blue and green colors emitted by EL light emission areas**
Patent Assignee: CASIO COMPUTER CO LTD (CASK)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week

JP 2000277257 A 20001006 JP 9978319 A 19990323 200065 B

Priority Applications (No Type Date): JP 9978319 A 19990323
Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
JP 2000277257 A 25 H05B-033/12

Organic electroluminescent **light emitting device for use as back light of non-spontaneous light display device, emits...**

Abstract (Basic):
... Stripe shaped **organic EL** light emission areas (5r,5g,5b) emitting red, green and blue colors are provided on...
... An INDEPENDENT CLAIM is also included for **organic EL** display device...

...as back light of non-spontaneous light display device such as liquid crystal display device, **organic EL** display device...

...As **white** light is emitted by combining **red , blue** and **green** colors, **efficiency** is improved and high intensity light is emitted with low power consumption...

...The figure shows the explanatory drawing of **organic EL** light emitting device...

11/3,K/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.

013038141 **Image available**
WPI Acc No: 2000-209993/200019
XRAM Acc No: C00-065347
XRPX Acc No: N00-156797
Organic electroluminescence **elements giving** higher **lighting performance in** blue **to** white color **- comprises bisbenzazole compounds**
Patent Assignee: FUJI PHOTO FILM CO LTD (FUJF)
Number of Countries: 001 Number of Patents: 001
Patent Family:
Patent No Kind Date Applicat No Kind Date Week
JP 11283746 A 19991015 JP 9881606 A 19980327 200019 B

Priority Applications (No Type Date): JP 9881606 A 19980327
Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
JP 11283746 A 10 H05B-033/14

Organic electroluminescence **elements giving** higher **lighting performance in** blue **to** white color -
...Abstract (Basic): ADVANTAGE - The EL element provides a **higher** lighting performance, especially, in **blue** to **white colour** .

11/3,K/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.

011700094
WPI Acc No: 1998-117004/199811
XRAM Acc No: C98-038570
XRPX Acc No: N98-093916
Organic electroluminescent **device - comprising luminescent picture elements made of base electrode and counter electrode arranged on substrate**
Patent Assignee: IDEMITSU KOSAN CO LTD (IDEK)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 10003990	A	19980106	JP 96174286	A	19960613	199811	B

Priority Applications (No Type Date): JP 96174286 A 19960613
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 10003990	A		35	H05B-033/14	

Organic electroluminescent **device...**

...Abstract (Basic): The **organic EL** device comprises a number of luminescence picture elements, formed by multilayering the base electrode, the...

...USE - The **organic EL** device is used as the white colour EL device...

...ADVANTAGE - The **organic EL** device, with which **white colour** luminescence in high brightness and high **efficiency** is possible, can be obtd...

11/3,K/6 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010445749
WPI Acc No: 1995-347066/199545
XRPX Acc No: N95-259434
Organic electroluminescent **device - distributes colouring matter in macromolecular form and light emitting layer has white light emitting layer**
Patent Assignee: SHINGIJUTSU JIGYODAN (SHKJ)
Number of Countries: 000 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 7220871	A	19950818	JP 948785	A	19940128	199545	B

Priority Applications (No Type Date): JP 948785 A 19940128
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 7220871	A		7	H05B-033/14	

Organic electroluminescent **device...**

...Abstract (Basic): ADVANTAGE - Provides **white** light emitting layer with high intensity. Provides **effective** , full **colour** device...

11/3,K/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010065447
WPI Acc No: 1994-333159/199441
Related WPI Acc No: 2001-244022
XRAM Acc No: C94-151594
XRPX Acc No: N94-261428

Organic electroluminescent element used as emitter of the luminescence - has 1,2,4-triazole deriv layer, carrier transport control layer, and electron transport layer

Patent Assignee: SUMITOMO ELECTRIC IND CO (SUME)
Inventor: KIDO J

Number of Countries: 019 Number of Patents: 013
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9422974	A1	19941013	WO 94JP435	A	19940317	199441	B
JP 7003257	A	19950106	JP 93147849	A	19930618	199511	
JP 7041759	A	19950210	JP 93186223	A	19930728	199516	
EP 647694	A1	19950412	EP 94910036	A	19940317	199519	
			WO 94JP435	A	19940317		
JP 7090260	A	19950404	JP 94112502	A	19940526	199522	
EP 647694	A4	19950726	EP 94910036	A		199617	
JP 2734338	B2	19980330	JP 93147849	A	19930618	199818	
JP 2734341	B2	19980330	JP 93186223	A	19930728	199818	
US 5869199	A	19990209	WO 94JP435	A	19940317	199913	
			US 95343494	A	19950111		
SG 59953	A1	19990222	SG 964373	A	19940317	199931	
JP 2937015	B2	19990823	JP 94112502	A	19940526	199939	
EP 647694	B1	19990915	EP 94910036	A	19940317	199942	
			WO 94JP435	A	19940317		
DE 69420656	E	19991021	DE 620656	A	19940317	199950	
			EP 94910036	A	19940317		
			WO 94JP435	A	19940317		

Priority Applications (No Type Date): JP 93186224 A 19930728; JP 9368783 A 19930326; JP 93122927 A 19930525; JP 93147849 A 19930618; JP 93186223 A 19930728

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9422974	A1	J	62	C09K-011/06	
Designated States (National): US					
Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE					
JP 7003257	A		6	C09K-011/06	
JP 7041759	A		12	C09K-011/06	
EP 647694	A1	E	45	C09K-011/06	Based on patent WO 9422974
Designated States (Regional): DE FR GB					
JP 7090260	A		19	C09K-011/06	
EP 647694	A4			C09K-011/06	
JP 2734338	B2		6	C09K-011/06	Previous Publ. patent JP 7003257
JP 2734341	B2		12	C09K-011/06	Previous Publ. patent JP 7041759
US 5869199	A			H05B-033/12	Based on patent WO 9422974
SG 59953	A1			H05B-033/12	
JP 2937015	B2		22	H05B-033/22	Previous Publ. patent JP 7090260
EP 647694	B1	E		C09K-011/06	Based on patent WO 9422974
Designated States (Regional): DE FR GB					
DE 69420656	E			C09K-011/06	Based on patent EP 647694
					Based on patent WO 9422974

Organic electroluminescent **element used as emitter of the luminescence...**

...Abstract (Basic): An **organic electroluminescent** element comprises a 1,2,4-triazole deriv. layer...

...3-(4-bisphenylyl)-4-phenyl-5-(4-tert-butylphenyl) 1,2,4-triazole (TAZ). The **organic electroluminescent** element comprises a poly-N-vinylcarbazole (PVK) layer as a hole-transport luminescent layer and...

...USE/ADVANTAGE - The element is useful as an emitter of **blue** luminescence, primary multi- **colour** luminescence and **white** luminescence. The element has an excellent luminous **efficiency** , luminance and stability...

11/3,K/8 (Item 8 from file: 347)
DIALOG(R)File 347:JAPIO

07592536 **Image available**
ORGANIC LIGHT - EMITTING DIODE DEVICE

PUB. NO.: 2003-086380 [JP 2003086380 A]
PUBLISHED: March 20, 2003 (20030320)
INVENTOR(s): HATWAR TUKARAM KISAN
APPLICANT(s): EASTMAN KODAK CO
APPL. NO.: 2002-234508 [JP 20022234508]
FILED: August 12, 2002 (20020812)
PRIORITY: 01 930050 [US 2001930050], US (United States of America), August 15, 2001 (20010815)

ORGANIC LIGHT - EMITTING DIODE DEVICE

ABSTRACT

PROBLEM TO BE SOLVED: To provide a highly **efficient** , **white color** emitting **organic light - emitting diode** device.

SOLUTION: The **organic light - emitting diode** device comprises (a) a substrate, (b) an anode arranged on top of the substrate, (c...

11/3,K/9 (Item 9 from file: 347)
DIALOG(R)File 347:JAPIO

07348478 **Image available**
ORGANIC ELECTRIC FIELD LIGHT-EMITTING ELEMENT

PUB. NO.: 2002-216969 [JP 2002216969 A]
PUBLISHED: August 02, 2002 (20020802)
INVENTOR(s): ISHII MASAHIKO
NODA KOJI
MIURA ATSUSHI
OWAKI TAKESHI
TAGA YASUNORI
TANAKA HIROMITSU
APPLICANT(s): TOYOTA CENTRAL RES & DEV LAB INC
APPL. NO.: 2001-008284 [JP 20011008284]
FILED: January 16, 2001 (20010116)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a superior white light emitting **organic EL** element.

SOLUTION: This has at least an organic light-emitting layer and an electron transport...
... to this blue. Because the electron transport layer exerts a high positive hole block function, **blue** light-emitting **efficiency** increases, and **blue color** purity can be improved, and a superior **white** light emission is obtained. If a single layer of the blue color light-emitting layer and the electron transport layer are combined, a blue light-emitting **organic EL** element of a high color purity can be realized.

11/3,K/10 (Item 10 from file: 347)

07295691 **Image available**

WHITE COLOR **ORGANIC ELECTROLUMINESCENCE** PANEL

PUB. NO.: 2002-164170 [JP 2002164170 A]
PUBLISHED: June 07, 2002 (20020607)
INVENTOR(s): KISHIGAMI YASUHISA
KIDO JUNJI
KONDO YUKIHIRO
TSUBAKI KENJI
APPLICANT(s): MATSUSHITA ELECTRIC WORKS LTD
KIDO JUNJI
APPL. NO.: 2000-360219 [JP 2000360219]
FILED: November 27, 2000 (20001127)

WHITE COLOR **ORGANIC ELECTROLUMINESCENCE** PANEL

ABSTRACT

PROBLEM TO BE SOLVED: To provide a **white color organic electroluminescence** panel that has high **efficiency** and a long life.

SOLUTION: This concerns a **white color** electroluminescence panel that is formed by holding an organic light-emitting material 3 between a...

11/3,K/11 (Item 11 from file: 347)

06025178 **Image available**

ORGANIC ELECTROLUMINESCENT ELEMENT

PUB. NO.: 10-308278 [JP 10308278 A]
PUBLISHED: November 17, 1998 (19981117)
INVENTOR(s): SATO YOSHIHARU
OGATA TOMOYUKI
MURATA YUKICHI
APPLICANT(s): MITSUBISHI CHEM CORP [000596] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 09-118107 [JP 97118107]
FILED: May 08, 1997 (19970508)

ORGANIC ELECTROLUMINESCENT ELEMENT

ABSTRACT

PROBLEM TO BE SOLVED: To stably emit the light of **white color** with excellent **color** pureness and high light emitting **efficiency** by forming an element of a positive hole transporting layer, which includes a benzothioxanthene derivative...

11/3,K/12 (Item 12 from file: 347)

DIALOG(R)File 347:JAPIO

05999394 **Image available**

LIQUID CRYSTAL DISPLAY DEVICE

PUB. NO.: 10-282494 [JP 10282494 A]
PUBLISHED: October 23, 1998 (19981023)
INVENTOR(s): KANEKO NORIHIKO
SHIRASAKI TOMOYUKI
APPLICANT(s): CASIO COMPUT CO LTD [350750] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 09-102425 [JP 97102425]
FILED: April 07, 1997 (19970407)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a liquid crystal display device provided with an **organic EL** surface light emitting panel capable of obtaining **white** light having high intrasurface uniformity and executing highly **efficient** light emission and having **color** display performance...

...SOLUTION: An **organic EL** element 15 for executing blue surface light emission is formed on the back of a...

11/3,K/13 (Item 13 from file: 347)

DIALOG(R)File 347:JAPIO

03384990 **Image available**

ORGANIC ELECTROLUMINESCENCE ELEMENT

PUB. NO.: 03-047890 [JP 3047890 A]
PUBLISHED: February 28, 1991 (19910228)
INVENTOR(s): HOSOKAWA CHISHIO
KUSUMOTO TADASHI
AZUMA HISAHIRO
APPLICANT(s): IDEMITSU KOSAN CO LTD [330172] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 02-067249 [JP 9067249]
FILED: March 19, 1990 (19900319)
JOURNAL: Section: C, Section No. 831, Vol. 15, No. 189, Pg. 142, May 15, 1991 (19910515)

ORGANIC ELECTROLUMINESCENCE ELEMENT

ABSTRACT

PURPOSE: To obtain the title element capable of obtaining **blue** luminescence having high brightness in high **efficiency** and also

obtaining **white** luminescence and suitable as luminescent element for various display devices by using a compound having...
?

12/3,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.

015267764 **Image available**
WPI Acc No: 2003-328693/200331
XRPX Acc No: N03-262872

Color organic electroluminescent **display** power saving **method for personal computer, involves converting** color **digital image into monochrome image which is displayed using** white **light emitting elements of display**

Patent Assignee: EASTMAN KODAK CO (EAST)
Inventor: SIWINSKI M J
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 20020186214	A1	20021212	US 2001874128	A	20010605	200331	B

Priority Applications (No Type Date): US 2001874128 A 20010605
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020186214	A1		6	G09G-005/00	

Color organic electroluminescent **display** power saving **method for personal computer, involves converting** color **digital image into monochrome image which is displayed using** white **light emitting elements of display**

Abstract (Basic):
... A portion of a **color** digital image is converted into a monochrome image which is displayed by using the **white** light emitting elements in the display (30).
... An INDEPENDENT CLAIM is included for **color organic electroluminescent** display...

...For **saving power** in **color organic electroluminescent** flat panel display (claimed) such as **organic light emitting diodes** (OLEDs) used in personal computer, personal digital assistant, laptop computer, cellular telephone, etc...

...Since the **white** light elements are used to display the monochrome image, the power consumption is **efficiently** reduced in the display...

Title Terms: **COLOUR** ;
International Patent Class (Main): **G09G-005/00**
?